

## CLAIMS

1. An exhaust sensor controller for an exhaust sensor mounted in an exhaust path of an internal combustion engine, wherein said exhaust sensor includes a sensor element for generating an output in accordance with the status of an exhaust gas and a heater for heating said sensor element, the exhaust sensor controller comprising:

heater control means for continuing power supply control over said heater until the ambient temperature for the exhaust sensor drops below 80°C after the internal combustion engine is stopped.

2. The exhaust sensor controller according to claim 1, further comprising element temperature acquisition means for acquiring the temperature of said sensor element, wherein said heater control means includes after-stop power supply control means for controlling said heater with a predetermined temperature between 300°C and 500°C set as a target temperature for said sensor element after the internal combustion engine is stopped.

3. The exhaust sensor controller according to claim 1 or 2, wherein said heater control means comprises stop moment exhaust temperature estimation means, which estimates the exhaust path temperature at a stop moment

of the internal combustion engine, and

temperature condition determination means, which determines whether the exhaust path temperature is below 80°C based on the exhaust path temperature at said stop  
5 moment and the elapsed time after said internal combustion engine is stopped.

4. An exhaust sensor controller for an exhaust sensor mounted in an exhaust path of an internal combustion engine,  
10 wherein said exhaust sensor includes a sensor element for generating an output in accordance with the status of an exhaust gas and a heater for heating said sensor element, the exhaust sensor controller comprising:

recovery value counting means for counting the  
15 elapsed time or the cumulative intake air amount after internal combustion engine startup as a characteristics recovery value;

heater control means for controlling said heater with a recovery target temperature, which is higher than a normal  
20 target temperature, set as a target temperature for said sensor element until said characteristics recovery value reaches a recovery determination value;

cumulative lean time counting means for counting, after internal combustion engine startup, the cumulative  
25 length of time during which the air-fuel ratio is lean; and

determination value correction means for increasing

said characteristics recovery value or decreasing said recovery determination value with an increase in said cumulative length of time.

5           5. An exhaust sensor controller for an exhaust sensor mounted in an exhaust path of an internal combustion engine, wherein said exhaust sensor includes a sensor element for generating an output in accordance with the status of an exhaust gas and a heater for heating said sensor element,  
10 the exhaust sensor controller comprising:

recovery value counting means for counting the elapsed time or the cumulative intake air amount after internal combustion engine startup as a characteristics recovery value;

15           heater control means for controlling said heater with a recovery target temperature, which is higher than a normal target temperature, set as a target temperature for said sensor element until said characteristics recovery value reaches a recovery determination value;

20           stop period counting means for counting stop period during which the internal combustion engine is stopped; and

determination value correction means for decreasing said characteristics recovery value or increasing said recovery determination value with an increase in the stop  
25 period during which the internal combustion engine is stopped.

6. An exhaust sensor controller for an exhaust sensor mounted in an exhaust path of an internal combustion engine, wherein said exhaust sensor includes a sensor element for  
5 generating an output in accordance with the status of an exhaust gas and a heater for heating said sensor element, the exhaust sensor controller comprising:

cumulative lean time counting means for counting, after internal combustion engine startup, the cumulative  
10 length of time during which the air-fuel ratio is lean; and

heater control means for controlling said heater with a recovery target temperature, which is higher than a normal target temperature, set as a target temperature for said sensor element until said cumulative length of time reaches  
15 a recovery determination value.

7. The exhaust sensor controller according to claim 6, further comprising:

recovery value counting means for counting the  
20 elapsed time or the cumulative intake air amount after internal combustion engine startup as a characteristics recovery value; and

determination value correction means for increasing said cumulative length of time or decreasing said recovery  
25 determination value with an increase in said characteristics recovery value.

8. The exhaust sensor controller according to claim 6 or 7, further comprising:

stop period counting means for counting stop period  
5 during which the internal combustion engine is stopped; and

determination value correction means for decreasing  
said cumulative length of time or increasing said recovery  
determination value with an increase in the stop period  
during which the internal combustion engine is stopped.

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9. An exhaust sensor controller for an exhaust sensor  
mounted in an exhaust path of an internal combustion engine,  
wherein said exhaust sensor includes a sensor element for  
generating an output in accordance with the status of an  
15 exhaust gas and a heater for heating said sensor element,  
the exhaust sensor controller comprising:

element temperature acquisition means for acquiring  
the temperature of said sensor element;

desorption progress value counting means for  
20 counting the elapsed time or the cumulative intake air amount  
after the temperature of said sensor element reaches the  
desorption temperature of an adsorbable species adsorbed  
by the sensor element as a desorption progress value;

output correction means for correcting the output of  
25 said exhaust sensor in accordance with a sensor output  
correction value; and

correction value calculation means for decreasing said sensor output correction value with an increase in said desorption progress value.

5           10. The exhaust sensor controller according to claim  
9, further comprising stop period counting means for  
counting the stop period during which the internal  
combustion engine is stopped, wherein said correction value  
calculation means includes initial value setup means, which  
10 increases the initial value for said sensor output  
correction value with an increase in said stop period.